THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte JOSEPH J. PIGNATELLO

_____

Appeal No. 1996-0270
Application 08/118,128[1]

_____

HEARD: July 13, 1999

_____

Before PAK, OWENS and KRATZ, *Administrative Patent Judges.*

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 1-5, 8-10 and 19-22, which are all of the claims remaining in the application.

THE INVENTION

[1] Application for patent filed September 8, 1993.

Appellant claims a method for decontaminating soil which contains an organic compound having at least one oxidizable aliphatic or aromatic functional group, by contacting the soil with a recited ferric chelate and a peroxide compound in the presence of water at the pH of the soil. Claim 1 is illustrative and reads as follows:

1. A method for decontaminating soil containing an organic compound having at least one oxidizable aliphatic or aromatic functional group comprising contacting the soil with an active, soluble ferric chelate selected from the group consisting of ferric nitrilotriacetate and ferric hydroxyethyleniminodiacetate and a peroxide compound in amounts effective to achieve oxidation of the soil contaminating compound in the presence of water at the pH of the soil.

THE REFERENCES

Pignatello 5,232,484 Aug. 3, 1993

Yunfu Sun et al. (Sun), "Chemical Treatment of Pesticide Wastes. Evaluation of Fe(III) Chelates for Catalytic Hydrogen Peroxide Oxidation of 2,4-D at Circumneutral pH", 40 *J. Agric. Food Chem.* 322-27 (1992).

THE REJECTION

Claims 1-5, 8-10 and 19-22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Sun in view of Pignatello.

OPINION

We have carefully considered all of the arguments advanced by appellant and the examiner and agree with the examiner that the claimed invention would have been obvious to one of ordinary skill in the art at the time of appellant's invention over the applied prior art. Accordingly, we sustain the aforementioned rejection.[2]

Appellant argues that the claims stand or fall in four groups as follows: 1) claims 1, 5 and 8-10, 2) claims 2-4, 3) claims 19 and 20, and 4) claims 21 and 22 (brief, pages 3-4). We therefore limit our discussion to one claim in each group, namely, claims 1, 2, 19 and 21. *See In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(5)(1993).

Rejection of claim 1

---

[2] Pignatello is not prior art because it has the same inventive entity as the present application and was not issued more than one year prior to the filing date of the present application. Consequently, we do not consider Pignatello. The examiner relies upon Pignatello merely for a teaching that 2,4-D is a pesticide (final rejection mailed June 7, 1994, paper no. 8, page 3), which is disclosed by Sun (page 322, right column, first full paragraph) and acknowledged by appellant (specification, page 6, lines 18-19). Thus, our excluding Pignatello from consideration does not cause our affirmance to involve a new ground of rejection.

For appellant's claimed method to have been *prima facie* obvious, the prior art must have fairly suggested, to one of ordinary skill in the art, carrying out the claimed method, and also must have provided such a person with a reasonable expectation of success in doing so. *See In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988); *In re Longi*, 759 F.2d 887, 892-93, 225 USPQ 645, 648 (Fed. Cir. 1985). Sun discloses (pages 322-23) that contamination of soil by pesticide waste is a problem, and that a number of ligands for Fe^{3+} form ferric chelates which are effective, in combination with hydrogen peroxide, for oxidizing 2,4-dichlorophenoxyacetic acid (2,4-D) which, appellant acknowledges (specification, page 6, lines 18-19), was a known pesticide. Appellant also acknowledges that Sun discloses the ferric chelates used in appellant's method (specification, page 6, lines 1-5; page 7, lines 19-21). The disclosure by Sun, therefore, would have provided one of ordinary skill in the art with motivation to use appellant's ferric chelates to decontaminate soil. As explained as

follows, Sun also would have provided one of ordinary skill in the art with a reasonable expectation of success in doing so.

Sun's oxidations are carried out at a pH of 6 (page 322). As acknowledged by appellant (specification, page 8, lines 29-30), this pH typically is the pH of soil.

Sun's oxidations take place in aerated aqueous solution (page 322). Thus, no soil is present in Sun's tests. However, appellant states that appellant's method can be carried out using a slurry of soil in water, that the amount of water in which the soil is slurried is not critical, and that amounts of water which are much larger than 1 part water per 0.3 to 0.5 parts of soil can be used (specification, page 8, lines 8-18). Thus, when we give appellant's claims their broadest reasonable interpretation consistent with the specification, *see In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983); *In re Herz*, 537 F.2d 549, 551, 190 USPQ 461, 463 (CCPA 1976); *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976), we conclude that the term "decontaminating soil" encompasses carrying out the

decontamination in a slurry which contains a small amount of soil and a large amount of water.

As for whether one of ordinary skill in the art would have reasonably expected Sun's method to be effective when applied to a slurry containing soil contaminated with 2,4-D, rather than to an aqueous solution of 2,4-D as in Sun's tests, we note the following.

Sun teaches that a promising method for decomposing 2,4-D, which was demonstrated using an aqueous solution of 2,4-D, is oxidation by use of hydrogen peroxide and Fe^{3+} (page 322). Sun also teaches that one of the two proposed mechanisms proposed for the oxidation using hydrogen peroxide and Fe^{3+}, i.e., the classical radical mechanism, involves the Fenton reaction (page 326).[3] Appellant acknowledges that Fenton-type systems were known in the art to be effective for oxidizing soil contaminants in soil suspensions (specification, page 3, lines 8-20).[4]

---

[3] The other disclosed mechanism involves formation of high-valent iron-oxo specides originating from either Fe(II) or FE(III) (page 326).

[4] It is axiomatic that our consideration of the prior art must, of necessity, include consideration of the admitted

Because Fenton-type systems were known to be effective for decontaminating soil in a slurry, and because Sun indicates that his method is considered to be operable through one of two mechanisms, one of which involves the Fenton reaction, one of ordinary skill in the art would have had a reasonable expectation that the Sun method would be effective for decontaminating soil in a slurry. We note that for a *prima facie* case of obviousness to be established, only a reasonable expectation of success, not absolute certainty, is required. *See O'Farrell*, 853 F.2d at 903-04, 7 USPQ2d at 1681.

For the above reasons, we hold that the method recited in appellant's claim 1 would have been *prima facie* obvious to one of ordinary skill in the art at the time of appellant's invention over Sun.

Appellant argues that Sun does not take into account the potentially interfering substances in soil or the sorption of

---

prior art. *See In re Hedges*, 783 F.2d 1038, 1039-40, 228 USPQ 685, 686 (Fed. Cir. 1986); *In re Davis*, 305 F.2d 501, 503, 134 USPQ 256, 258 (CCPA 1962).

ferric chelates into soil (brief, pages 4-5; reply brief, page 3). As explained above, one of ordinary skill in the art would have had a reasonable expectation that Sun's method would be applicable to a slurry of soil in water. Because it was known in the art that the factors referred to by appellant do not prevent Fenton-type systems from being effective for oxidizing soil contaminants in a soil slurry, and because Sun teaches that one of the two mechanisms postulated for his method involves the Fenton reaction, one of ordinary skill in the art would have had a reasonable expectation that the factors referred to by appellant likewise would not prevent Sun's method from being effective for oxidizing soil in a slurry. Appellant refers to the Pignatello declaration (filed March 23, 1994, paper no. 7) wherein it is stated (page 3) that "[s]oil contains substances that sorb the pesticide and potentially inactivate the chelate catalyst, and substances that destroy hydrogen peroxide by reacting with it (*e.g.*, with soil organic matter), consuming it (*e.g.*, with microbes), and decomposing it (*e.g.*, with metal ions in minerals)." Appellant, however, provides no explanation as to why one of

ordinary skill in the art who was aware that Fenton systems are effective for decontaminating soil in a slurry and was aware of Sun's teaching regarding the mechanism of his method, as discussed above, would have considered Sun's method to be ineffective for decontaminating soil in a slurry.

Appellant argues that Sun states (page 326, col. 2, lines 10-11) that nitrilotriacetic acid and hydroxyethylimino-diacetic acid were relatively unstable, and that this teaching points away from using these compounds (brief, pages 7-8; reply brief, pages 7-8). Sun not only teaches that these compounds were relatively unstable, but also teaches that they were relatively active (page 326). When determining whether to use these compounds, one of ordinary skill in the art would have balanced the greater activity against the relative instability.

Appellant argues that chelates made using picolinic acid and rhodizonic acid were among the chelates found by Sun to have high activity in water, but that appellant has found that these chelates leave no more than 2% iron in solution after addition to soil suspensions (brief, page 7). Appellant's specification (page 23, lines 9-11) shows that

hydroxyethyleniminodiacetate and nitrilotriacetate, which are two of appellant's ligands, form chelates which leave about 9-34% Fe in solution. Appellant's argument is not persuasive because the observed results would have been expected by one of ordinary skill in the art. Because hydroxyethyleniminodiacetic acid and nitrilotriacetic acid are stronger acids than picolinic acid and rhodizonic acid, one of ordinary skill in the art would have expected the hydroxyethyleniminodiacetate and nitrilotriacetate to attract the iron more strongly and thereby compete better with the soil than picolinic acid and rhodizonic acid with respect to keeping the iron in solution. It is not enough for appellant to show that the results for appellant's process and the comparative process differ. The difference must be shown to be an unexpected difference. *See In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972).

Appellant argues (brief, page 6; reply brief, page 6) that the Pignatello declaration states (page 3) that the amounts of peroxide and chelate required to obtain degradation

were less than expected. This argument is not persuasive because appellant has not provided a comparison with the closest prior art, which is Sun,[5] *see In re Baxter Travenol Labs*., 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984), or provided evidence which is commensurate in scope with the claims. *See In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035, 206 USPQ 289, 296 (CCPA 1980).

Rejection of claims 2, 19 and 21

Appellant's arguments that Sun teaches away from obtaining the percentage of ferric chelate which does not sorb to the soil recited in claim 2, and that NTA as recited in claim 21 is relatively unstable (brief, page 8), are addressed above in the discussion of the rejection of claim 1. Regarding claim 19, the chelate in that claim, as in claim 1, can be ferric nitrilotriacetate or ferric hydroxyethyleniminodiacetate. Consequently, the method

[5] Appellant acknowledges that Sun is the closest prior art (reply brief, page 6).

recited in claim 19 would have been fairly suggested to one of ordinary skill in the art by Sun for the reasons given above regarding claim 1.

Conclusion

For the above reasons, we conclude, based on the preponderance of the evidence, that the methods recited in appellant's claims 1, 2, 19 and 21 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

DECISION

The rejection of claims 1-5, 8-10 and 19-22 under 35 U.S.C. § 103 over Sun in view of Pignatello is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

)
CHUNG K. PAK)

Administrative Patent Judge)
)
)
) BOARD OF PATENT
TERRY J. OWENS)
Administrative Patent Judge) APPEALS AND
)
) INTERFERENCES
)
PETER F. KRATZ)
Administrative Patent Judge)

Dale L. Carlson
Intellectual Property Section
Wiggin and Dana
One Century Tower
New Haven, CT 06508-1832

TJO/caw